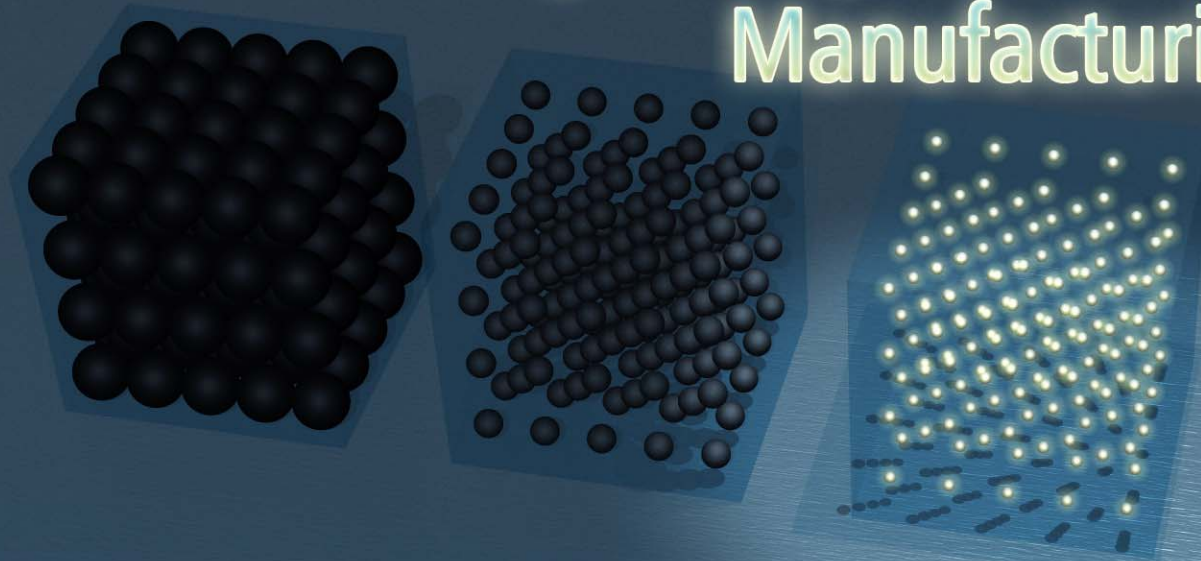


# Lightweight and Modern Metals Manufacturing Innovation Institute



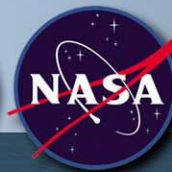
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### Program Information

*Johnnie DeLoach*

*Naval Materials Division*

*Office of Naval Research*



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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Outline

- National Network for Manufacturing Innovation
- Lightweight and Modern Metals Innovation Institute
  - Institute Focus
  - Systems Engineering Approach
  - Advanced Manufacturing Objectives
- Solicitation

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Advanced Manufacturing Partnership



*... This initiative offers a unique opportunity for the United States to discover, develop, manufacture, and deploy advanced materials at least twice as fast as possible today, at a fraction of the cost.*

President Barack Obama, 24 June 2011  
Announcing the Advanced  
Manufacturing Partnership

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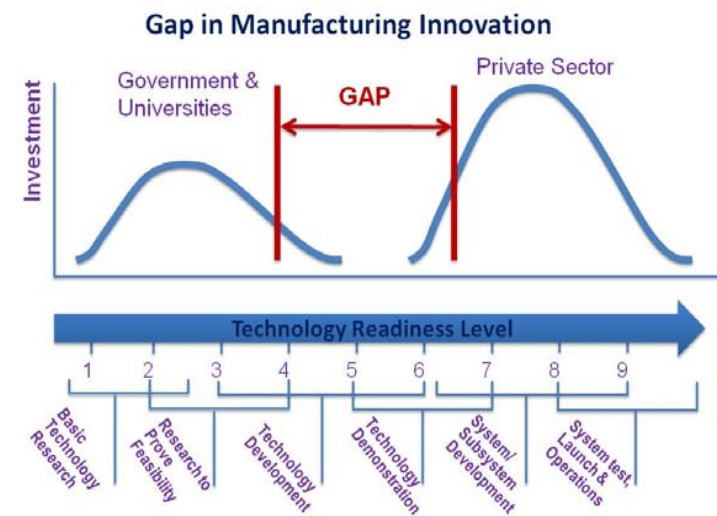
# Lightweight and Modern Metals Manufacturing Innovation Institute

## National Network for Manufacturing Innovation

- *A multi-agency collaboration between industry, government and universities*
- *Public-private partnership led by a non-profit organization*



- Shared facilities open to industry
  - Especially attractive to small businesses
- Enabling technology transition and commercialization
- Addressing Technology Readiness Level (TRL) / Manufacturing Readiness Level (MRL) 4-7
  - Bridge the gap in Manufacturing Innovation
- Educational center to train the future workforce
- Sustainable within 5 years



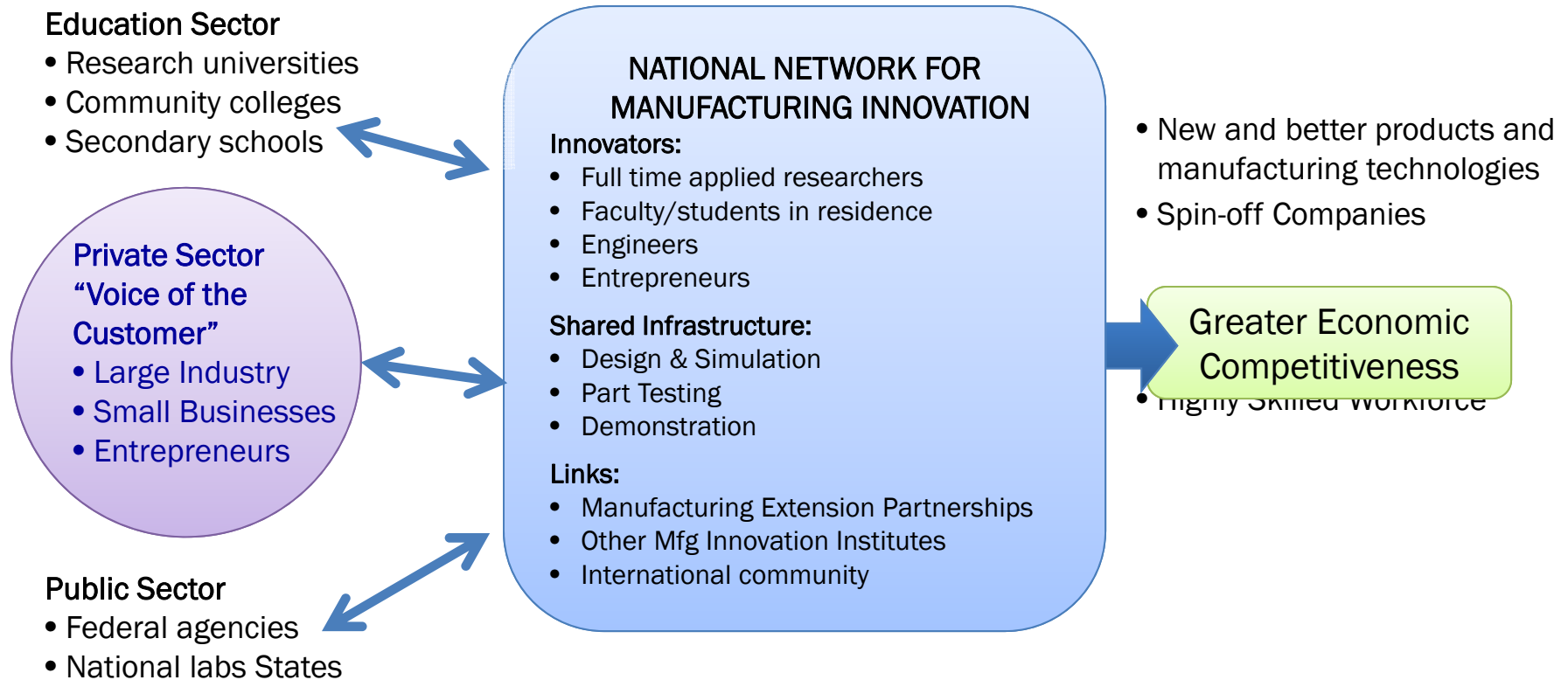
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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Vision of NNMI



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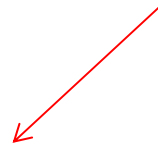


# Lightweight and Modern Metals Manufacturing Innovation Institute

## Institutes

- Collection of Networked Institutes
- Foci
  - Additive Manufacturing
  - Lightweight and Modern Metals
  - Digital Manufacturing and Design
  - Power Electronics
- See: <http://manufacturing.gov>
  - LinkedIn
  - BAA
  - NNMI Preliminary Design Document

You Are Here



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# Lightweight and Modern Metals Manufacturing Innovation Institute



*Institute Focus: Demonstrate Advanced Manufacturing Capabilities to Enable Systems with Key Attributes:*

- Lightweight
- Reliable
- Survivable
- Fuel Efficient
- Affordable (broad market demand)
- Flexible (increased margin for growth)

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## LM3I Application Areas

- Application of new/novel metals and alloys
- Primary metal manufacturing
- Secondary metal manufacturing
- Development of products exploiting lightweight and modern metals

Using a Systems Engineering Approach to  
Advanced Manufacturing

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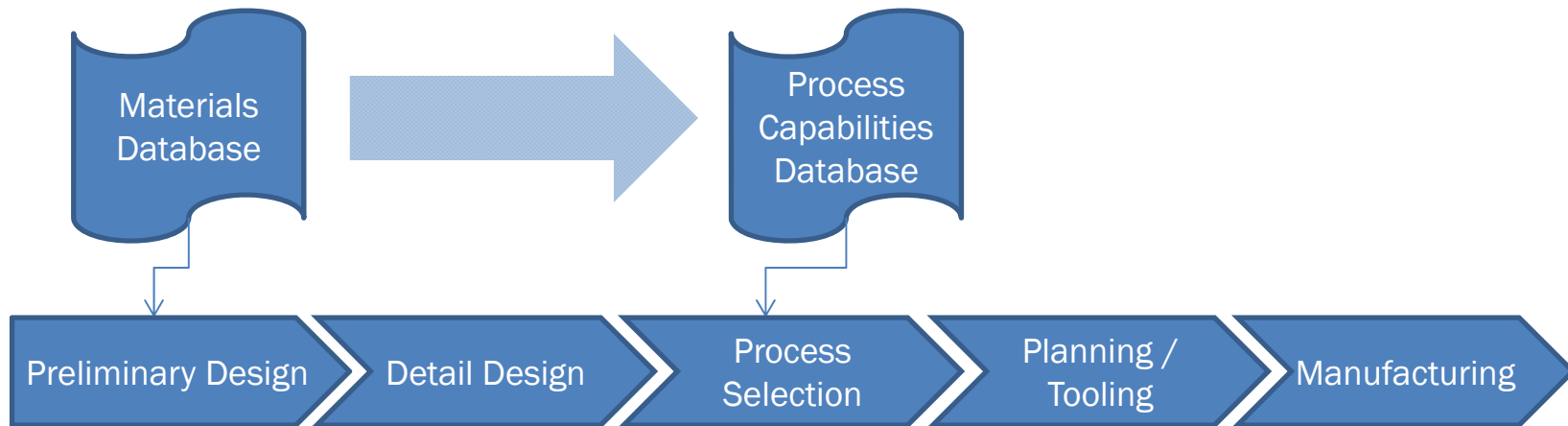
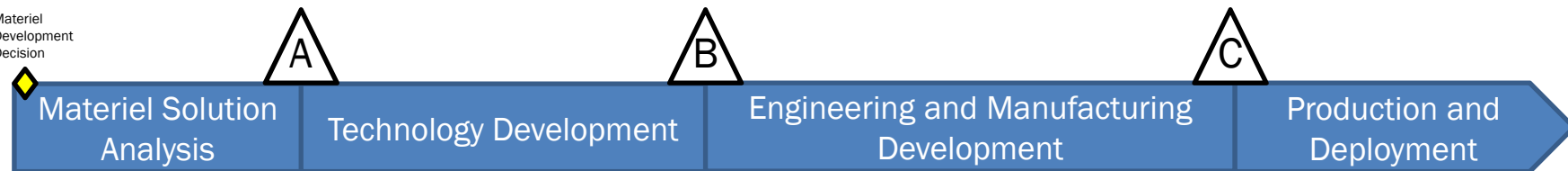




# Lightweight and Modern Metals Manufacturing Innovation Institute

## System Design Process

Material  
Development  
Decision



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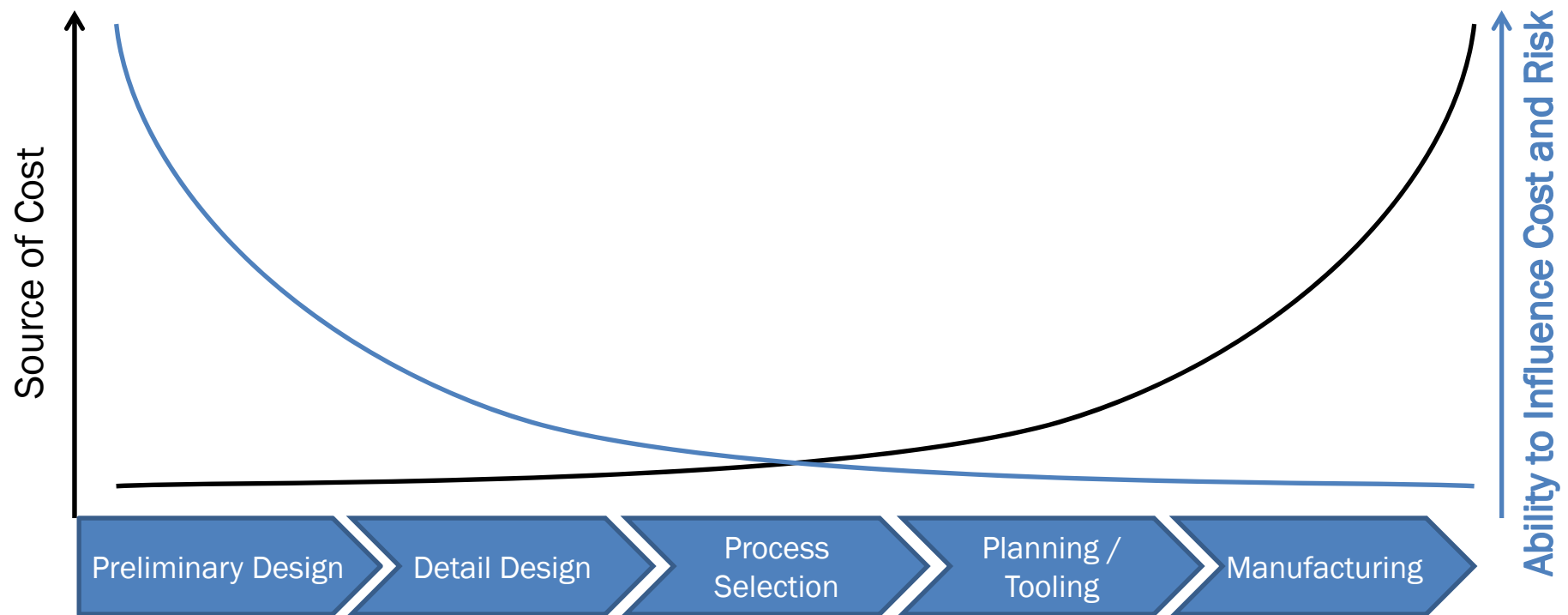
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# Lightweight and Modern Metals Manufacturing Innovation Institute

## System Design Tradeoffs



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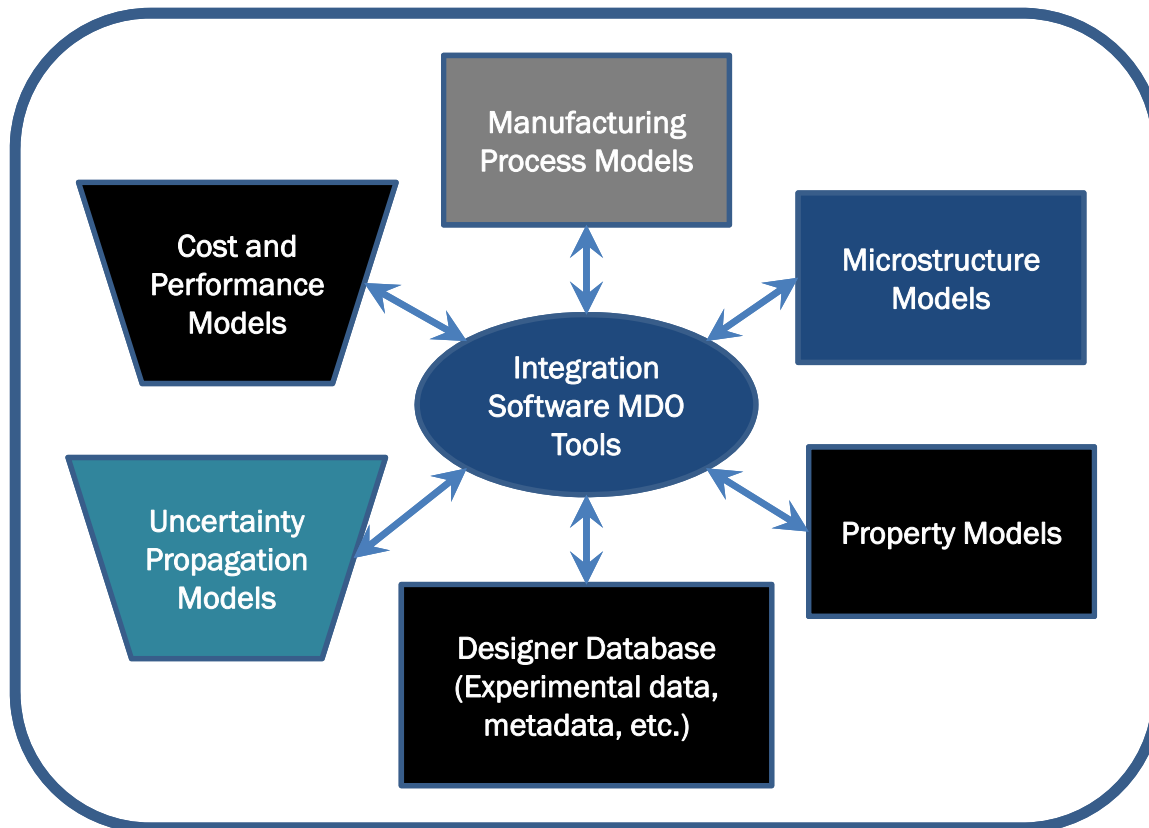
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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Integrated Computational Materials Engineering (ICME) for Advanced Manufacturing



Emphasis  
on the  
“I” and “E”

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Advanced Manufacturing Objectives

- Metal Foci: Al, Mg, Ti, other modern metals
- Four themes
  - Production Scale-up
  - Shorten Design-to-Production Cycle
  - Affordable Manufacturing Processes
  - Tools, Skills, Knowledge for Manufacturing Workforce, from Design to Manufacturing
- Integrated design, metals processing, and manufacturing of PRODUCTS

Target Maturity Focus: MRL 4 thru 7

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Solicitation Basis

- Cooperative Agreement
  - DoD Grants and Agreements Regulations (DoDGARs)
  - Non-Profit Organization, independent operation from Universities and Companies
  - Intent is to found a Unique National Resource

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Estimated Funding Profile

- Minimum 1:1 Industry Cost Share.

MINIMUM PROGRAM FUNDING (\$ IN MILLIONS)						
FISCAL YEAR	FY 14	FY 15	FY 16	FY 17	FY 18	TOTAL
FEDERAL FUNDING	17	14	14	14	11	70
INDUSTRY COST SHARE (MINIMUM)						70
TOTAL PROGRAM (MINIMUM)						140

ONRBAA13-009 takes precedence over presentation

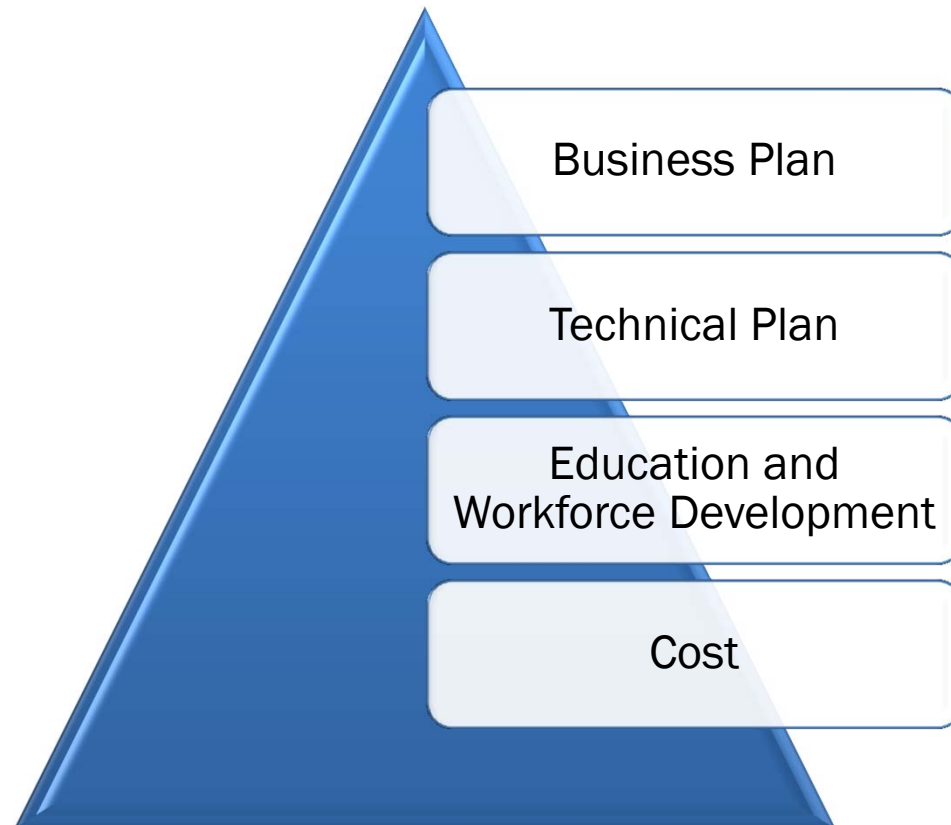
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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Evaluation Criteria



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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Evaluation Criteria (Cont.)

- Business Plan
  - Attaining Self-Sufficiency
  - Organizational Structures
  - Infrastructure Concept
  - Strategy
  - Intellectual Property Management

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Evaluation Criteria (Cont.)

- Business Plan (Cont.)
  - Defense and Economic Impact
  - Risk Identification
  - Management Capabilities
  - Operations

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Evaluation Criteria (Cont.)

- Technical Plan
  - Technical Strength
  - Technological Impact
  - Innovation Beyond Current Practice
  - Personnel Qualifications

Applied to each project

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# Lightweight and Modern Metals Manufacturing Innovation Institute

## Evaluation Criteria (Cont.)

- Education and Workforce Development
  - Quality and degree of integration of educational and workforce/professional development and training components.
    - Consideration of all levels of education.
    - Evidence of a plan to establish career pathways that encompass secondary, 2- and 4-year and graduate-level institutions.

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